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ABSTRACT

Four different observational systems and two time sequences were employed to determine the extent to which they would yield different incidences of anti-social behavior. Two videotapes, randomly chosen from a pool of 30 tapes, were utilized. These illustrated the behaviors of anti-social children in a natural setting. Six observers were reliably trained in the observational systems. Observers, systems, time sequences, and tapes were assigned randomly and counter-balanced, thus providing for a within experimental replication. The results of the experiment indicate no significant differences for time sequences or observational systems. The results are discussed briefly in terms of their significance for time sampling methods used in behavioral analyses. (Author)

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# EFFECTS OF DIFFERENT OBSERVATIONAL SYSTEMS AND TIME SEQUENCES UPON NON-PARTICIPANT OBSERVERS' BEHAVIORAL RATINGS*

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by

John S. Wodarski
Adjunct Professor of Social Work, Washington University, St. Louis, Missouri
Research Director, Group Integration and Behavioral Change Project
Jewish Community Centers Association
St. Louis, Missouri

Ronald A. Feldman
Acting Dean, Washington University School of Social Work, St. Louis, Missouri
Principal Investigator, Group Integration and Behavioral Change Project
Jewish Community Centers Association
St. Louis, Missouri

Stephen J. Pedi
Assistant Research Director, Group Integration and Behavioral Change Project
Jewish Community Centers Association
St. Louis, Missouri

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Requests for this manuscript should be sent to the first author at Washington University, St. Louis, Missouri 63130.

ABSTRACT

Four different observational systems and two time sequences were employed to determine the extent to which they would yield different incidences of anti-social behavior. Two videotapes, randomly chosen from a pool of 30 tapes, were utilized. These illustrated the behaviors of anti-social children in a natural setting. Six observers were reliably trained in the observational systems. Observers, systems, time sequences, and tapes were assigned randomly and counter-balanced, thus providing for a within experimental replication. The results of the experiment indicate no significant differences for time sequences or observational systems. The results are discussed briefly in terms of their significance for time sampling methods used in behavioral analyses.

Introduction

Behavior modification practice is based on three essential procedures: (1) The analysis of target behaviors chosen for modification in terms of observable events; (2) Definition of the behaviors in a manner that enables two persons to consistently agree that the selected behavior has occurred; and (3) The systematic collection of data to determine if selected antecedent or consequent behaviors significantly influence the rate of the behavior chosen for modification (Baer, Wolf, and Risley, 1968; Bijou, Peterson, Harris, Allen, and Johnston, 1969; Bijou, 1970).

In the last decade implementation of these procedures has been facilitated through the introduction of significant methodological advances in the measurement of social behavior, particularly the behavior of autistic, hyperactive, anti-social, and retarded children (Cohen and Filipczak, 1971; Browning and Stover, 1971; Graziano, 1971; Hamblin, Buckholdt, Ferritor, Kozloff, and Blackwell, 1971; Tharp and Wetzel, 1969). However, little attention has been given to the question of whether or not different types of measurement systems or time sequences, e.g., securing more observations on a child, differentially influence the frequency of behaviors observed and, therefore, the conclusions derived by investigators.

Some recent research indicates that differential observer effects take place in the recording of behavior. For instance, observers rate behaviors differently when they are aware of the experimental hypothesis, know that the behavior is being simultaneously used by others to assess reliability ratings, and so forth. Likewise, observers' definitions of behavior change over time unless periodic retraining sessions are held to assure reliable observations (Johnson and Bolstad, 1973; Jones, 1973; O'Leary and Kent, 1973; Romanczyk, Kent, Diament, and O'Leary, 1973; Skindrud, 1973). The present investigation seeks to evaluate the differential effects, if any, of four different observational systems

and two different time sequences on the ratings secured by observers of anti-social behavior exhibited by children.

## METHODOLOGY

### Videotapes

Two videotapes were selected randomly from a pool of 30 tapes which were compiled during a larger study. They had been utilized to train non-participant observers and had served as training devices for therapists working with groups of anti-social children in a community based treatment program.[1] Children were referred to the program from various agencies, including a special school district, mental health centers, juvenile courts, children's homes, and so forth. To help professionals (e.g., teachers, counselors, psychologists, and social workers) refer children to the project the investigators devised a checklist illustrating the types of behaviors that a child should exhibit in order to be considered for referral. The behaviors denoted on the checklist were analogous to those tested on the observational scales used for the study. The two tapes depicted children exhibiting anti-social, non-social, and pro-social behavior in two activity contexts, finger painting and making model airplanes. Each was 30 minutes in length.

### Non-Participant Observers

Six university students were trained to use the four observational scales until each could reliably rate the children's behavior through the use of other tapes not utilized in the present study. The observers were considered trained when they could agree with the first author and with each other at a .90 level. The study lasted for eight 30-minute experimental sessions, with one session held per week. To insure consistency of the behavioral definition throughout the

[1] A detailed explanation of the project is available from the first author upon request.

study, reliability checks on the behavioral definitions were held weekly. In addition, one of the four scales was randomly chosen for each session in order to secure an additional check on whether the raters used the system reliably after the initial training. The following formula yielded a ratio of inter-observer agreement interval by interval.

$$\text{Ratio of inter-observer agreement} = \frac{\text{Number of agreements}}{\text{Number of agreements + number of disagreements}}$$

All of these checks were above .90, with a mean of .98.

Observational Systems

1. System #1 involved rating the following behaviors: pro-social, non-social, and anti-social. Observers were instructed to rate the first behavior observed at the beginning of a ten-second interval.

2. For system #2 observers were instructed to look at a child for an entire ten second interval; if he exhibited any anti-social behavior during the ten-second interval the observer was to mark this interval accordingly. Only the category of anti-social behavior was used for this system.

3. For system #3 the observers were to watch the child for each ten-second interval and mark all three behaviors (pro-social, non-social, and anti-social) if they occurred. These could only be marked once per interval.

4. For system #4 the observers were to record within each ten-second interval all anti-social behavior exhibited by a child every time it occurred. Again, like system #2, only the category of anti-social behavior was used.

Time Sequences

The two time sequences utilized in the study involved (a) having one observer rate each child in a group on a ten-second rotating basis until all five children were rated once, and then repeating the process continuously for the

duration of the meeting and (b) having one observer rate one of the five children in the group on a ten-second basis for the entire session.

Design

The design was a 2 x 4 x 2 factorial where the first factor was designed as tapes, the second as observational system, and the third as time sequence. The assignment of tapes, systems, time sequences, and observers to all cells was randomly counter-balanced. Since two tapes were utilized the study was replicated once (Campbell and Stanley, 1967). None of the observers who participated in the study were informed of the hypothesis. It is doubtful that the observers could have deduced the hypothesis of the study since they also were securing data for the previously mentioned program which maintained a large number of hypotheses. The following behavioral definitions were used throughout the entire study for pro-social, non-social, and anti-social behavior. Only the general definitions of pro-social and non-social behavior are provided since the major interest was anti-social behavior.[2]

Behavioral Categories

Pro-social behavior generally was defined as any behavior directed toward completion of the group task or toward participation in the group activity. Non-social behavior was defined as behavior not directed toward completion of the group task but which did not interfere with another child's participation in the group task or activity. Anti-social behavior was defined as any behavior exhibited by a group member which prevented the other group members from participating in the group task or activity. The following behavioral descriptions were used in the initial training and then for the actual observation of anti-social behavior.

[2]Specific behaviors used in the definition of pro-social and non-social behavior are available from the first author upon request.

Anti-social behavior is indicated when the following behaviors occur:

(a) Verbalizations: A child talks to another child and thus disrupts the latter's participation in the group activity; a child talks to another child and thus disrupts someone else who is trying to participate in the group activity; a child speaks without directing the conversation toward anyone; a child engages in name-calling, crying, screaming loud, laughing, coughing, disruptive singing, disruptive whistling, and so forth.

(b) Gross Motor Behaviors: If the children are seated around the table or in a circle but the child is out of seat or position without the therapist's permission, or if he is running, jumping, skipping, standing up, hopping, moving a chair, or walking around aimlessly, thus disrupting the group activities.

(c) Object Interference: A child plays with some object that interferes with another child's participation in the group, e.g., taps a pencil on the table or slams things on furniture.

(d) Physical Contacts: Contact is initiated by one child toward another who is participating in the group activity. This contact disrupts the latter child's participation. The contact may include hitting, kicking, shoving, pinching, slapping, striking with an object, throwing an object which hits another person, poking with an object, biting, pulling hair, patting, touching, or disturbing another child's property.

(e) Distracting Behaviors: A child engages in physical movement that attracts another child's attention and causes the latter to stop participating in the group activity. The former child may turn his head or body to look at another child, show an object to another child, rock in a chair, sit out of position, clean or rummage in furniture, and so forth.

## RESULTS

The data for Tape 1 (see Figure 1) suggest that the different observational

Insert Figure 1 about here

systems and time sequences do yield different estimates of anti-social behavior; however, the differences are statistically non-significant. The data represent the mean of anti-social behavior tabulated by averaging all the observations that each observer made while watching one child or watching all the children on a rotating basis. The specific data were as follows for Observation System I (OSI) according to watching all the children (AC) 13.04% and an observer watching one child (OC) 9.39%; OSII: AC, 17.86%, OC, 13.48%; OSIII: AC, 16.27%, OC, 16.27%; OSIV: AC, 7.23%, OC, 13.48%.

Likewise, the data in Figure 2, for Tape 2, show the same pattern. Again

Insert Figure 2 about here

it is evident that different observational systems yield varying incidences of anti-social behavior, but again the differences are non-significant. The specific data were as follows for Observation System I (OSI) according to watching all the children (AC) 21.27% and an observer watching one child (OC) 18.84%; OSII: AC, 29.88%, OC, 20.70%; OSIII: AC, 17.28%, OC, 17.44%; OSIV: AC, 13.97%, OC, 20.77%. It is interesting to note that in the data for system #3 the time sequence variation did not account for a great deal of the variance in either tape. However, in the other systems the time sequence used to secure the data (e.g., having one observer view each child or having an observer view the whole group on a rotating basis) did make somewhat of a difference. Likewise, the data reported in both figures suggest that system #4, having an observer mark all acts of anti-social behavior while watching the five children on a rotating basis, reduces the recorded rate of anti-social behavior. This lost data might be attributable to the recording procedure wherein the observer tallies an anti-social behavior each time it occurs. Thus, anti-social behavior that occurs while the observer

is recording may not be observed. To eliminate this possible data loss each child might be observed for the entire ten-second interval and then the observer might take five seconds to record the number of anti-social behaviors observed.

An arcsin transformation of the percentage data was carried out in order to meet the various assumptions required to perform an analysis of variance assessing the effects of tape, observational system, and time sequences (Wike, 1971). The results are shown in Table 1. The tests of significance show no

Insert Table 1 about here

significant difference between observational systems and time sequences. The amount of anti-social behavior on Tape 2 was greater than that on Tape 1. However, since there were no significant interactions the findings are not affected.

## DISCUSSION

The original hypothesis was that the different time sequences and observational systems studied would differentially affect the data collected by non-participant observers. However, the hypothesis was not supported. The variations that occurred between systems and time sequences were not significantly different. Thus, the investigation provides support for the assumption that random time sampling procedures nullify differences in observational format and the timing of observations. The former are based on securing proportionate samplings of behavioral data that are representative of the total incidence of such behavior expected for the children within a given social context. If reliable, differing data gathering systems are likely to yield essentially the same data. The selection of an observational system for an empirical study should depend on its conceptual relationship with the purposes of the research. The data reported in Figures 1 and 2 indicate that there are slight variations in data secured

according to different types of observational systems and time sequences. Consequently, before data are secured for a study, a pilot test of various observational systems and time sequences contemplated for use would help to assess whether or not the resulting differences would be substantial enough to affect the various hypotheses being tested.

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TABLE I

ANALYSES OF VARIANCE FOR TAPES, OBSERVATIONAL SYSTEMS, AND TIME SEQUENCE

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Total | .9546 | 79 | ----- | ----- |
| Tapes | .0759 | 1 | .0759 | 5.873* |
| Observational System | .0246 | 3 | .0082 | .6323 |
| Time Sequence | .0022 | 1 | .0022 | .1700 |
| Tapes x Observation System | .0171 | 3 | .0057 | .4415 |
| Tapes x Time Sequence | .0002 | 1 | .0002 | .0122 |
| Observational System x Time Sequence | .0060 | 3 | .0020 | .1582 |
| Tapes x Observational System x Time Sequence | .0030 | 3 | .0010 | .0784 |
| Error | .8256 | 64 | .0129 | ----- |

* $p < .05$

Note. --- The data points used for the analysis of variance represent the mean average of all anti-social behavior observed either by an observer watching each child or all five children for each experimental session.

Fig. 1

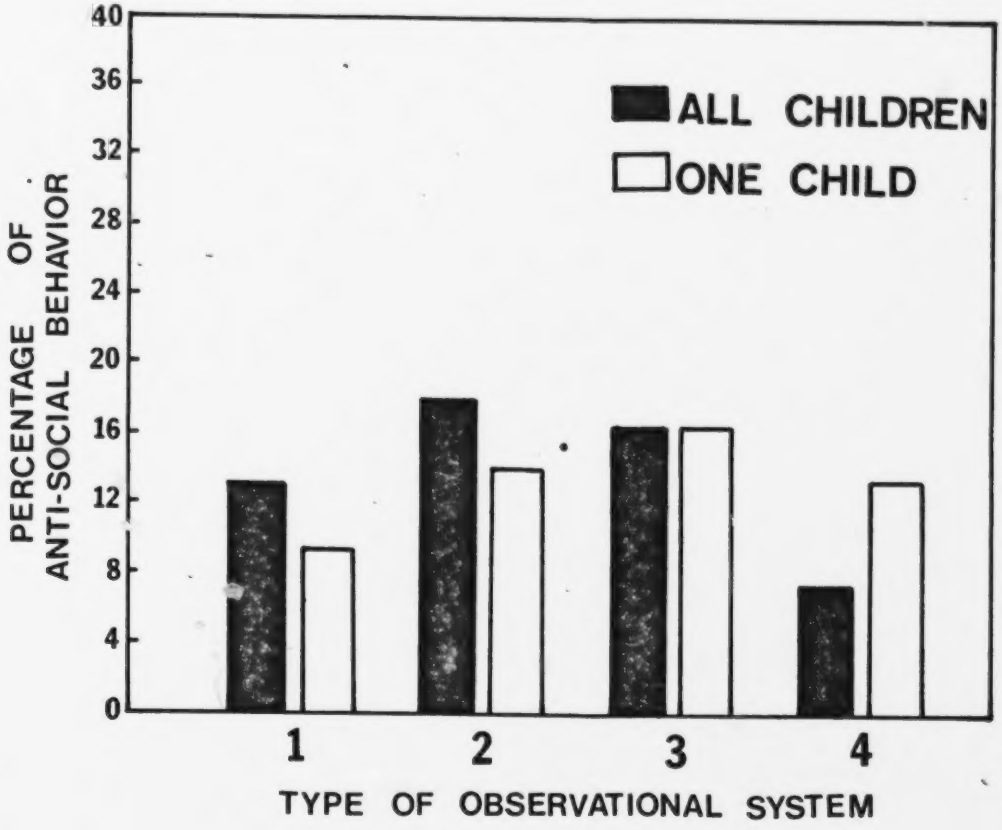
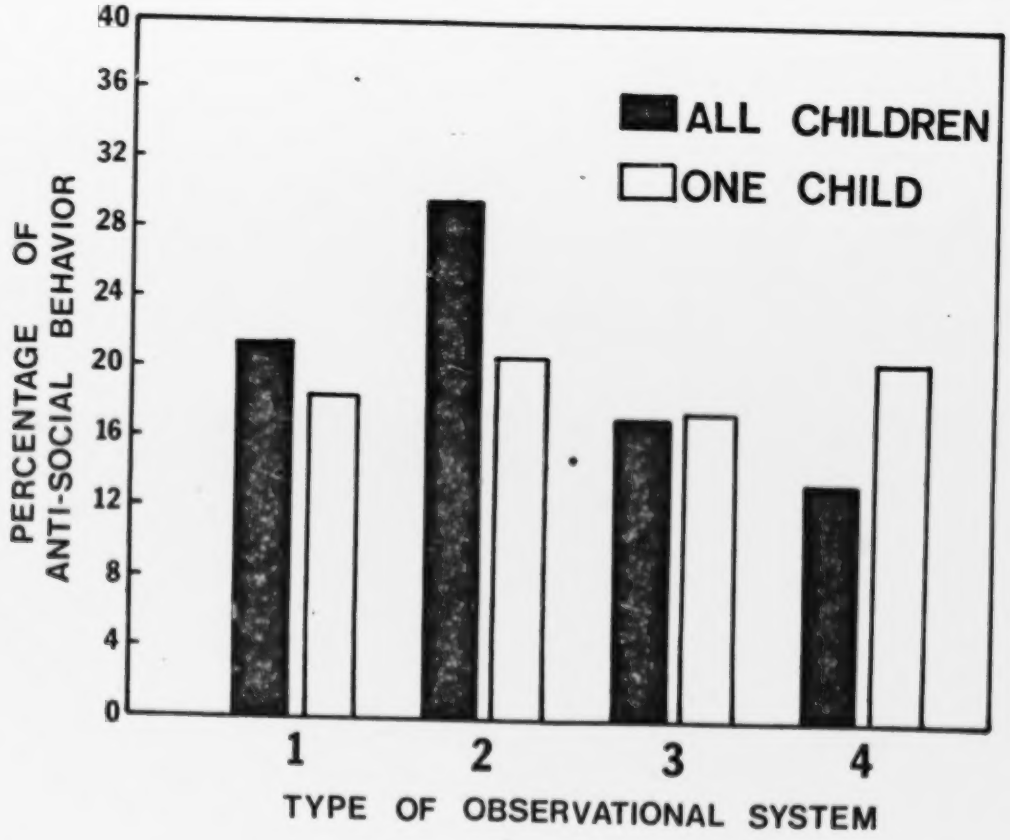

40
36
32
28
24
20
16
12
8
4
0
PERCENTAGE OF ANTI-SOCIAL BEHAVIOR
ALL CHILDREN
ONE CHILD
1
2
3
4
TYPE OF OBSERVATIONAL SYSTEM

Fig. 2


40
36
32
28
24
20
16
12
8
4
0
PERCENTAGE OF ANTI-SOCIAL BEHAVIOR
ALL CHILDREN
ONE CHILD
1
2
3
4
TYPE OF OBSERVATIONAL SYSTEM